FLIGHT

The AIRCRAFT ENGINEER & AIRSHIPS

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport

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Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list:—

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June 25–30	**International Air Congress, London**
June 30	**R.A.F. Aerial Pageant, Hendon**
July 20–21	**Air Race for King's Cup**
July 16	**Unveiling of R.A.F. Memorial by H.R.H. The Prince of Wales**
July 20	**Gothenburg Exhibition**
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Dec. 1	**Entries close for French Aero Engine Competition**

EDITORIAL COMMENT.

JUST as we go to press the announcement is made that Mr. Stanley Baldwin has been asked, and has agreed, to form the new Cabinet. Mr. Baldwin is somewhat of an unknown quantity in higher politics, although during the last few months his quiet forcefulness has placed him in the foremost rank. It is to be hoped that such few changes as will be made in the existing Government will not extend to the Secretary of State for Air, thus avoiding, with the change in Premiership, any risk of a check upon the present favourable development of aviation. In Mr. Bonar Law we had a Premier who was at any rate favourably disposed towards aviation, and who might almost be said to be "one of us," owing to the fact that his daughter is the wife of Sir Frederick Sykes, whose very great interest in and past work for aviation needs no elaboration here. Thus, although Sir Frederick is no longer directly connected with aviation, it may be accepted that he continued to do all he could to further the good cause. He has been associated with aviation for too many years to be able to separate himself entirely from it, and we choose to think that the prominence given to aviation during Bonar Law's Government has been due in some considerable measure to the fact that the ex-Premier took a personal interest in aviation matters.

The New Premier

How Mr. Baldwin regards aviation is at the moment not known, but at any rate it is to be hoped, and may be assumed, that Sir Samuel Hoare, who has shown himself an almost ideal Air Minister, will not be supplanted under the new Premier. In fact, we would go further than that and suggest that the change may give the golden opportunity of joining up the Secretary of State for Air as a member of the Cabinet. We have called attention on several occasions to the handicap imposed by the fact that the Secretary of State for Air is not a member of the Cabinet, and we once more opportunely call attention to the point. Sooner or later this will have to be done, and as so favourable an opening may not present itself again in the near future, it might be wise to admit to the new Cabinet our very excellent Secretary of State for Air.

Skywriting

The rejection of the amendment moved in the House of Lords by Lord Birkenhead, to leave out Clause 2 of the Advertisement Regulation Bill, which prohibits advertisements by means of smoke in the air and defines the penalty for such offence, is very greatly to be regretted. When the first rumours of this new form of advertising reached us we spoke strongly against it, but after having witnessed a demonstration we were forced to change our views on the subject, and to admit that there certainly was nothing "inartistic" in skywriting. As a matter of fact, letters or designs traced in the sky have a peculiar grace of their own, and in any case it should be remembered that except in a flat calm the smoke signs remain but for a very short time, and are thus in no way comparable to the hideous hoardings that now line our railways and, unfortunately, many of our roads.

Then there is the other side of the question, *i.e.*, the scientific side. If it were merely a matter of smoke advertisements against the sky, in spite of their being but temporary "emanations," there would be little to be said against the prohibition. But surely this is a case of helping to maintain that keeping-fit "Kruschen feeling" plus very valuable smoke screen experience against future (however distant) war-time requirements. Lord Birkenhead made the very telling point that this company is maintaining a large staff of pilots, mechanics and machines, and without a farthing paid in subsidy by the nation. Surely this is an important consideration, as both the personnel and material would be available in case of national emergency. Not only so, but the very means employed for writing words and signs in the sky are immediately applicable to scientific research, enabling the smoke to be discharged in front of a machine in flight, and thus observing, or even taking kinematograph films, from another aeroplane the flow of the air over the various parts of a machine. Thus most valuable research could be carried out on such subjects as "downwash," slipstream effect, etc. If these experiments are to be carried out entirely at the nation's expense they will be very costly. If, on the other hand, the firm is permitted to carry on its business, the research could probably be undertaken at a fraction of the cost. Thus from whatever point of view one approaches the subject one can scarcely fail to come to the conclusion that to prohibit skywriting would be both unfair and unwise.

When one looks into the matter it would appear that all this prejudice has been mainly engendered by some personal animus between Lord Newton and the *Daily Mail* as the "first offender." Surely that is the height of frivolity—for governing a serious proposition—and moreover it isn't true. If the *first* offender is to be "pilloried" by such very bold Parliamentary publicity then it surely should be our old and much-tried friend Wakefield's oil. *Theirs* was the first name to appear in the heavens above, writ large for all to read. Lord Newton's *bête noir* most emphatically lost by a head.

* * *

The Technical Press and New Aircraft

For some considerable time now the position of the technical aviation press has been rendered somewhat difficult by the decision on the part of the Air Ministry not to allow details to be published of new machines completed and flown. One result has been—not, perhaps, a very serious one, it is true—that in keeping faith with the Air Ministry the technical press has not divulged any information whatever about new productions, whereas the daily press, having no such scruples, has, especially quite recently, devoted quite a good deal of space to descriptions, sometimes fantastic, but nevertheless giving a good deal of information to anyone capable of reading between the lines and putting two and two together. Thus the section of the press which may be assumed to know what may be published and what should not is made to appear to be lagging behind in the knowledge of developments.

That, as we have already said, is not, perhaps, a very important matter. What is more serious is the fact that the aviation industry is deprived of a publicity which could not fail to increase the prestige of British aircraft throughout the world. In any case, a number of foreign countries have their representatives in Britain who keep in touch with what is being done, and the consequence is that most of these new machines are, as some wit put it, "a secret known to everyone but ourselves." The situation is quite an impossible one, and moreover ridiculous.

We suggest that as other countries are allowed to publish full particulars of their machines (we have this moment received from the constructor a detailed description of one of the latest French all-metal "chasers" with supercharged engine, *i.e.*, one of the very latest "hush-hush" machines) the British aeronautical technical press should be permitted to describe new machines so long as no reference was made to the armament and other equipment carried. In this way British constructional progress could be adequately dealt with, and without divulging anything which it is desired foreign governments should not know. As it is, a new machine may be produced which is of exceptional interest from a constructional point of view and whose special constructional features are covered by patents open to the world to inspect. Yet under the present arrangements no mention may be made of any such machine, although a description would certainly not divulge any secrets dealing with armament or special "gadgets." We feel sure that the reputation of the two representative British aviation technical journals which remain alive today is such that the Air Ministry need have no fear in giving a permit on the lines which we have suggested.

As the matter is one of considerable importance, not only to ourselves but to the aircraft industry, we would suggest that the Society of British Aircraft Constructors take it up with the proper departments at the Air Ministry, and endeavour to obtain a general permit for the technical press to give descriptions of new machines, so long as such descriptions are confined to treating the machines merely as aircraft, without reference to any special purpose for which they may have been built, or any special armament which they may carry.

* * * *

Mr. Short's Accident

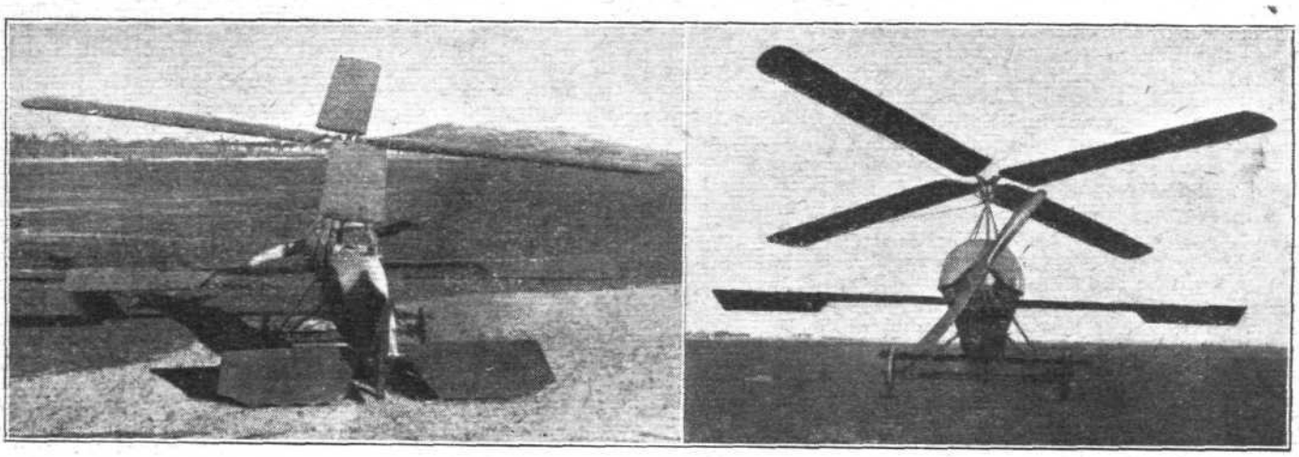
WE are glad to learn that Mr. Eustace Short is progressing favourably in hospital after his very serious motoring accident last week, in which his little daughter was killed. It appears that the car struck a very bad pot-hole, with the result that some part of the steering mechanism was bent, thus putting the car out of control. All our readers will join us in expressing sympathy with Mr. Short in his very great loss, and wish him personally a speedy recovery

FLIGHT

THE CIERVA "AUTOGIRO"

SOME tests have recently been carried out at Getafe, near Madrid, with an extremely interesting and original type of machine, the invention of a young Spanish engineer, Don Juan de la Cierva. This machine is known as the "Autogiro," and is what might be described as being midway between the aeroplane and the helicopter.

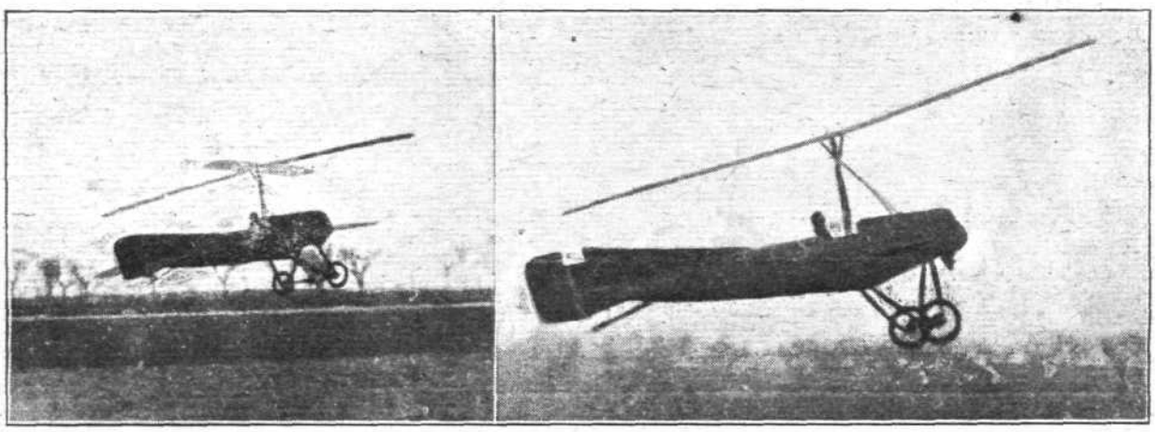
Unfortunately, we have not at the moment any detailed particulars of this machine, but the accompanying illustrations will give an idea of its general arrangement. It consists, firstly, of an orthodox aeroplane fuselage, complete with engine, tractor airscrew, tail surfaces, and landing chassis. Secondly, just in front of the pilot's cockpit, is mounted a pylon carrying a large four-bladed "wing-screw," which is slightly inclined from the horizontal at an angle positive to the direction of flight, *i.e.*, forward. Thirdly, extending laterally from the sides of the fuselage—where the wings would be located in an aeroplane—are what are to all intents and purposes ailerons. The spar carrying these ailerons is more or less of wing-form, but is, as may be seen from the front view of the machine, very narrow, and would not contribute any appreciable amount of lift.



Rear and front views of the Cierva "Autogiro."

As far as we can learn, the *modus operandi* of the "Autogiro" is as follows. The machine starts off in the ordinary way—as in the case of an aeroplane—by aid of the engine-driven tractor screw. As it progresses forward the flow of air past the "wing-screw" causes the latter to rotate, with the result, it appears, of producing sufficient lift to enable the machine to rise. Lateral balance is maintained by means of the aileron extensions at the side.

It is claimed that the "Autogiro" can descend with ease and safety with the engine cut off by the action of the "wing-screw" alone. During the trials at Getafe, when flights at over 20 m. high and various evolutions were accomplished, descents were made at a remarkably slow rate and, it is stated, almost vertical. The horizontal landing speed was about 10 km. (6 miles) p.h. Other details of the action and control of the "wing-screw" are lacking, and we await further information on the matter with interest.



Two views of the "Autogiro" in flight.

The Gothenburg Exhibition

FROM the fact that British participation in the Gothenburg Exhibition, from July 20 to August 12, is now ensured, it is hoped that a large number of people interested in aviation will take the opportunity to pay a visit to this old Swedish town. Special arrangements have been made to facilitate travel, and, in addition to the special excursion trips organised by Cook's, Ellerman's Wilson line, the R.M.S.P. Company, etc., the Swedish Lloyd Steamship Company maintains a regular service between Tilbury or Newcastle and Gothenburg. During July and August steamers leave Tilbury every Saturday and Tuesday, the first class return fare being 15 guineas and second class return £11 10*s.* 0*d.* From Newcastle the boats for Gothenburg leave on Wednesdays, and the return fares are £15 and £11 respectively. A Swedish visa will be necessary, but British visitors will not be required to pay any passport fee.

With regard to hotel accommodation, we understand that two up-to-date hotels have been specially built and a floating hotel established on a liner moored in the port. A billeting office forms part of the organisation, and the prices at hotels controlled by the exhibition amount to about 8*s.* 6*d.* for single rooms and 12*s.* 6*d.* for double-bedded rooms. Lunch will be obtainable in the exhibition restaurants for about 2*s.* and dinner for about 3*s.* 6*d.*

THE PROPOSED AIRSHIP LINE BETWEEN SPAIN AND SOUTH AMERICA

FROM a Résumé of Commercial and Technical Information issued by the Air Ministry we have extracted the following interesting points from the Report on the plans for a Spain-South America Airship Line drawn up by Commandante Emilio Herrera (originator of the scheme and Technical Director) and Dr. Hugo Eckener (of the Zeppelin Co.). The scheme was approved by the King of Spain in 1920, and was then submitted to the League of Nations. A company was formed in Spain, with Spanish capital and Sr. Antonio Goicoechea as Chairman, for the study of transatlantic air traffic, and a contract made with the Zeppelin Co. for the exclusive right to use Zeppelin-type airships for communications between the Latin-American countries, and between these and the rest of the world. A technical commission was next formed by the Zeppelin firm, and a full report on the establishment of the line, etc., which will be referred to later.

There will be two terminal aerodromes, one at Seville and one at Buenos Aires, with sheds, workshops, hydrogen factories and depôts, petrol and oil stores, etc. A landing-ground for emergencies, or possibly for a secondary air line, will be laid out at the Canary Islands, and another emergency landing-ground at Cordoba (Argentine), both with depôts for hydrogen, fuel and oil; each of these grounds will cover an area of 2,000,000 square metres. In view of the favourable meteorological conditions prevalent at Seville, it has been decided that one fixed double airship shed, 300 × 90 × 50 metres, would be sufficient for housing the airships. Thus two airships of 250,000 cubic metres could be berthed at the same time. The plans provide for all the most modern installations in the interior of the shed and on the landing-ground. Another shed, 150 × 50 × 50 metres, will also be erected for a school airship, and a third, 300 × 50 × 50 metres, will serve as the airship construction works. These works will be equipped for the assembly and eventually the entire construction of airships of 250,000 cubic metres. A W/T. station with 2,000 km. range will also be erected on this ground.

Owing to the variability of the winds at Buenos Aires, it will be necessary to erect a shed which will permit of taking the airship in and out with the wind in any direction, which means that there will have to be a shed of the revolving type, together with a fixed shed for the school ship, or one of the circular type. The revolving shed must measure 280 × 50 × 50 metres and the fixed shed 300 × 50 × 50 metres. A circular shed with about 16 doors would have the advantage of avoiding the heavy rotary mechanism and circular rails, and if it had a diameter of 350 metres would hold three airships. On the other hand, it would cost twice as much as the revolving shed and fixed shed for one airship. With respect to the installation in the Argentine the same remarks apply.

Four airships will be built for the regular service, in addition to a smaller school airship. The principal dimensions of the former are as follows: Capacity, 135,000 cubic metres (4,700,000 cubic ft.); overall length, 250 metres (825 ft.); maximum cross-section, 33·8 metres (110 ft.); overall height, including shock-absorber of car, 37 metres (122 ft.); maximum width, including air screws, 36 metres (119 ft.). With 760 mm. barometric pressure, temperature of gas and air 27° C., 60 per cent. relative humidity of the air and a specific gravity of the gas of 0·1, the airship has a lift of 141,500 kg. (139 tons), carries a useful load of 75,000 kg. (73·8 tons) and a commercial load of 15,000 kg. (14·75 tons). The latter is made up of 40 passengers, crew, goods, mails and supplies, and can be carried a distance of 12,000 km. (7,500 miles) at a speed of approximately 110 km./hr. (68·5 m.p.h.). With the engines for normal running working at full power a maximum speed of 120 km./hr. (77·5 m.p.h.) should be attained, and with the two reserve engines running as well a speed of 132 km./hr. (82·5 m.p.h.) can be reached, but the average speed may be taken as 110 km./hr. The flight of 10,000 km. (6,250 miles) could thus be carried out, assuming the absence of head wind, in about 83 hours at maximum speed, or in 91 hours at normal speed.

In construction these ships more or less follow usual Zeppelin practice. The power plant consists of nine 400 h.p. engines, seven of which run continuously for normal working, the remaining two being kept in reserve. There are four pairs of engine cars identical in design, which are suspended on either side amidships, and a ninth engine car centrally aft. The cars are suspended by means of the rigid "Zeppelin" system consisting of rods and cables and so placed that the noise and wind do not reach the passenger car situated forward.

The air-screws are of wood, with aluminium beading at the tips along the leading edges, and are provided with reversing gear in addition to disconnecting and fixing gear. The exhaust gases are evacuated through specially cooled silencers. The control car is integral with the hull, and contains the principal controls, the gas and ballast distributing boards, apparatus for the transmission of orders, navigation and performance instruments. In order to ensure the greatest possible degree of safety, the essential installations are duplicated.

The rudder controls are in the front part of the car and the elevator controls on the port side. The control surfaces are actuated by means of hand wheels acting on cables passing over rollers along the walking-way. Coupling devices make it possible to actuate one or several of the control surfaces at will. There is an emergency control station in the walking-way near the aft engine car. Orders are transmitted to the engine cars and crew's cabin by means of the engine telegraph.

Aft of the control car is the sound-proof wireless cabin on the left, and the commander's cabin on the right. The range of the set is 2,000 km. (1,250 miles). In addition to D.F. apparatus the set permits of communication with ground stations, being arranged for transmission and reception. The power is obtained from a dynamo driven by the relative wind.

The crew are accommodated in the walking-way, the officers near the control car; the mechanics and the remainder of the personnel amid ship. There are additional cabins in the stern. The passengers' car, which is integral with the control car, is 33 metres long (108 ft.) and 5 metres (16 ft.) wide, and gives plenty of space for free movement. It contains five cabins each for eight people: beyond is a saloon, kitchen, bar, lavatories, etc. Each of the five cabins has eight seats arranged in pairs, and at night can be converted into two sleeping cabins with four berths in each. The saloon accommodates 20 persons at four tables, and can, if necessary, take 40 people. Space for baggage, goods and mails is provided in the walking-way. A dynamo driven by the relative wind provides electric light all over the ship; there is also an accumulator battery.

It seems not only advisable but essential to acquire a small school airship as a preliminary to establishing the air line. This school airship would serve, among other things:—

(1) For training Spanish crews. There will be increasing need for these as traffic increases.

Crews are best trained on small airships, as these are easier to manœuvre, and the aerodynamic effects, effects of temperature variation, weather, etc., are more easily observed.

(2) For training shed and ground personnel. This work needs very special knowledge and long practice, which it is better not to have on the big ships.

(3) For training the personnel of the Seville W/T. station, and to prepare the future work of this station with the meteorological institutes, post and telegraph offices, etc., of Seville and vicinity.

(4) To permit of making observations and valuable experiments with respect to the movements of the trade winds, and special conditions with regard to winds, etc., in Andalusia and especially around Seville.

(5) The school airship could also be used to maintain regular communications with the Canary Isles, and the flights would probably be a financial success.

It is proposed that the school airship, which would have room for 20 passengers, goods and mails, should make a weekly or bi-weekly flight to the Canary Isles. The journey would take 10 to 11 hours outward and 14 to 15 hours coming back. A stay of one to two hours could be made at Teneriffe and a shed would not be needed there. A circular trip to the Sierra Nevada and around the south coast of Andalusia would prove a great attraction in good weather. Any remaining spare time could be spent in training and practice flights.

The cost price of the airship and shed would not be excessive, and the airship should be self-supporting. The State might subsidise the airship on condition that it was lent for the training of Army and Navy personnel.

The principal dimensions of the school ship are as follows:— Capacity, 30,000 cubic metres (1,000,000 cubic ft.); overall length, 144 metres (472 ft.); maximum diameter, 21·1

metres (69 ft.); maximum overall height, including shock absorbers on car, 26·5 metres (87 ft.); maximum overall width with air-screws, 22 metres (72 ft.); total lift, 31,500 kgs. (31 tons); useful load, 13,000 kgs. (12·8 tons).

The useful load for a 30 hours' flight could consist of 16 passengers, 16 pupils and about 1½ tons of luggage, supplies, mails and goods. With all engines running at full power a speed of 125 km./hr. (78 m.p.h.) should be attained; the average speed may be taken as 110 km./hr. (68·75 m.p.h.). The hull is exactly the same in construction as the big airships. There are three engines of 400 h.p. arranged, one in an engine car aft and the other two in two wing cars amidships. The control car is integral with the hull, and is specially arranged for the instruction of pupils. The W/T. station is to the left of the car. Cabins for crew and pupils are in the walking-way. The passenger car is behind that of the commander and joined to it. It has two compartments each seating eight persons, a dining-saloon, kitchen, lavatories, etc. Luggage, mails and goods are placed in the walking-way.

The following are extracts from Dr. Hugo Eckener's report on the technical and meteorological points of view :—

"As regards the Spanish terminus, the west of Andalusia is a suitable district, both geographically and with respect to winds and temperatures. A member of the Commission stayed in this district for some months making the necessary observations. Observations and study of existing meteorological data for Seville, Sanlucar, Jerez de la Frontera, San Fernando and Cordova established the fact that around Seville the meteorological conditions were exceptionally favourable for an air-port. The average velocity of the wind is only 1·3 m./sec., no wind velocity above 7 m./sec. being recorded. The direction of the wind is principally S.W. or N.E.

"The outskirts of Buenos Aires are the most suitable site for the Argentine air-port from the point of view of traffic. The average wind velocity is 4·4 m./sec., although occasionally gales of short duration occur with wind velocity exceeding 20 m./sec., but continuous gales are very rare. From observations made by the Commission over a month or more, it would appear that the winds are fresh but regular, and would not cause difficulties in manœuvring a big airship, whereas for landing a steady wind of 4-8 m./sec. is very useful.

"As the winds are distributed fairly uniformly from all quarters, a revolving or circular shed should be erected. Observations were made at Rosario and Cordova to ascertain whether these places offered greater advantages. At Rosario the average winds are slighter than at Buenos Aires (3·2 m./sec.), but gusts and changes of direction are the same as at Buenos Aires. Cordova was found to be peculiarly free from high winds, but had to be ruled out owing to its distance from the capital and great height above sea level. If a storm of long duration were raging around Buenos Aires, Cordova might be used as a temporary haven.

"The route may be divided into three divisions from the meteorological point of view: (1) from Spain to the neighbourhood of the Equator, including the north-east trade wind region; (2) from the Equator to Cabo Frio, including the south-east trade wind region; (3) from Cabo Frio to La Plata, where the winds are variable.

"*Division* 1.—In summer the trade winds begin to blow near the Spanish coast, and in winter in the neighbourhood of the Canary Islands. Weather is fine and the sky slightly or half covered. The wind velocity is about 6-8 m./sec. and the direction north-east. Storms are rare and more or less stationary, so that airships can easily fly round them. Squalls or other disturbances have not been observed. Near the Equator one passes through the region of calms to the south-east trade wind region. The calm region is round about latitude 5°, and the weather is always calm except at the end of the summer, when a moderate south-westerly wind, the African monsoon, blows in the eastern region. Heavy rains are frequent in the calm region, but they generally occur in the form of squalls over a small area, and can be flown round. Even heavy rains do not endanger the safety of a modern airship, as the lift is sufficient to compensate any overloading, and water ballast can be discharged in an emergency.

"The members of the Commission did not encounter a single gale in this region during four journeys over the route.

"*Division* 2.—This division shows the same conditions as the north-east trade wind region, with the one difference that the south-east trade winds are stronger, reaching a velocity of 8-12 m./sec. As these winds will only be side winds in respect of the airship, they will have only a very slight influence on its speed. There are no gales or other disturbances in this region.

"*Division* 3.—The route between Cabo Frio and La Plata presents varying conditions: the prevailing wind is north-east, but calms and winds varying from south-east to south-west are often experienced. Atmospheric disturbances are met with owing to the proximity of the land, but the airships should be able in cases of necessity to avoid unfavourable winds by keeping a more easterly course. The normal duration of the flight might be extended by about half a day by unfavourable conditions on this division. The temperatures registered during the commission's journeys were the same as those established many years before. The temperasure rarely exceeds 27°–28° in the hottest parts of the route. In short, the route may be considered one of the most suitable in the world for airship traffic.

In view of the data collected, it is not difficult to calculate the probable time taken for the flight.

"Suppose the airship to be travelling at 30 m./sec. in the north-east trade wind region and at a speed of 31 m./sec. on the return journey.

"The state of the winds may be calculated as follows :—

"(I) Outward Journey: Division 1, following wind of 6 m./sec.; Division 2, side wind of 8 m./sec.: Division 3, variable winds (on an average, a head wind of 2 m./sec.).

"(II) Return Journey: Division 3, variable winds (on an average, head wind of 2 m./sec.); Division 2, side wind of 8 m./sec.; Division 1, head wind of 6 m./sec.

"The distance-speed-time figures would be :—Outward Journey: Division 1, 4,700 kms., 36 m./sec., 37 hrs.; Division 2, 3,200 kms., 29 m./sec., 31 hrs.; Division 3, 2,000 kms., 28 m./sec., 20 hrs., or 9,900 kms. in 88 hrs. Return Journey: Division 3, 28 m./sec., 20 hrs.; Division 2 29 m./sec., 31 hrs.; Division 1, 25 m./sec., 51 hrs., or 102 hrs. total time.

"With respect to the return journey, it may be noted that the north-east trade winds cease at an altitude of 1,800 to 2,500 metres. The airship would thus probably be able to avoid the head wind in the first division, so that the time spent over this division would be 45 hrs., and the total would be reduced to 96 hrs.

"Summary of Estimated Cost

	Pesetas.
"I. Air port in Spain	14,000,000
Dwellings	600,000
Air port in the Argentine	24,000,000
Dwellings	600,000
	39,200,000
"II. Construction Works in Spain.	
Works	10,000,000
Dwellings	900,000
	10,900,000
"III*a*. Small shed for school airship in Spain	1,500,000
Wide shed for school airship ..	3,000,000
"III*b*. Extra cost for circular shed in Argentine	21,000,000 "

"The establishment of the line will be an important event for Europe and for the Argentine Republic, but more especially for Spain. Owing to the exceptionally good weather conditions in Seville, many airships proceeding from South and North America will prefer to land at Seville rather than go on to France or Great Britain.

"Rapid means of communication between Seville and the other European countries will be a big factor in enhancing the importance of Spain as a traffic centre. The utility of such airships and installations in case of war hardly needs emphasis.

"The Zeppelin firm has drawn up a detailed report of the establishment and operation of the transatlantic air line and auxiliary concerns, based on the valuable experience of this firm in such matters. The report establishes the fact that the concern will be highly profitable from a financial point of view.

"There will be two simultaneous flights per week in each direction on the Seville-Buenos Aires line: 3 days 16 hours will be taken over the outward flight and 4 days 6 hours over the return flight. Passengers will have all the comforts of an Atlantic liner, without the disadvantage of sea-sickness. The engines are placed at sufficient distance from the passenger car to give no unpleasant smell or vibrations.

"These airships do not, of course, constitute the final type, but simply represent a transition between existing airships

and the transatlantic airships of the future, which will be of 180,000 cubic metres (6,000,000 cubic ft.) volume and have a speed of 144 km./hr. (90 m.p.h.), carrying 60 passengers.

"The airship line could be inaugurated about two years after the shed, factories, construction works, etc., have been begun. The whole work of construction will be carried on in Spain.

"The Seville–Buenos Aires air line will be the first of a network of air lines linking up all the European and Latin-American countries. Seville will first be connected up with Genoa by a secondary air line placing Italy, and also the other countries of Western Europe, in communication with South America. A line connecting Seville with Cuba, Central America and Chile will link up Europe, with the Pacific coast, while another line between Pernambuco and Central America will follow the north-east coast of South America.

LONDON TERMINAL AERODROME

Monday, May 21, 1923

THE first German machine on the regular Berlin–London service arrived at Croydon on Monday evening. It was rumoured that M. Krassin was to come by this machine, but on its arrival at the aerodrome it appeared that the machine was one which had left Berlin on the previous Saturday, and had been in Amsterdam over the week-end. The machine on which M. Krassin was travelling only got as far as Amsterdam, and he finished the journey by boat and train. Judging from results, it would appear almost impossible for the German machines to complete the Berlin–London run in a day owing to their lack of speed, a feature which was strikingly illustrated on Monday, when one of the Daimler 34's left Amsterdam over an hour behind the German machine and arrived at Croydon a minute or two before it.

On Tuesday morning the German Dornier set off on its return trip with several passengers for Berlin, but, owing to engine trouble, was forced to come down at Lympne, and a Daimler 34 was sent to pick up the passengers and take them on to Amsterdam.

The regrettable accident to a Farman Goliath near Amiens caused much gloom at the air-station. Not only was M. Le Men one of the oldest pilots on the service, but the mechanic, M. Goubert, was very well-known to all the British pilots who have, at one time or another, been flying regularly to Paris. He will, perhaps, be better remembered by them as "Pierre."

The Non-Stop Express to Cologne

THE Instone Air Line's non-stop service to Cologne has met with great success, and full loads are the rule rather than the exception, while Handley Page Transport have every appearance of beating their previous records—made last month—for passengers carried during any one month. Already, in May, they have carried approximately 600 passengers between London and Paris.

On Wednesday Mr. H. S. Robertson accomplished strenuous day's work by piloting one of the Daimler "air expresses" from Croydon to Manchester and back, and then to Amsterdam and back. This speaks volumes for the efficiency of the Napier engines, and also for the Daimler methods of upkeep, in view of the fact that the same machine, G.EBBQ., had flown to Berlin on Monday and returned on Tuesday, its total mileage for the three days being somewhere in the region of 2,400.

Our Air Minister's Flying Tour

ON Thursday morning this same machine was put on the service to take Sir Samuel and Lady Hoare and Maj.-Gen. W. S. Brancker to Rotterdam. This was the first stage of a ten days' tour of continental air-lines by the Air Minister and Gen. Brancker. Their programme was to stay the night at the Hague, travel by a K.L.M. machine to Brussels the following day, and stay there until Sunday—when they were to fly by the Instone air-line to Cologne. From there their programme includes a flight on a de Havilland "air-taxi" to Paris and a return to London on the Handley Page Line. Sir Samuel Hoare stated, before starting, that his chief reason for making this series of flights was to obtain first-hand information regarding the running of the various air-lines, and also to meet and confer with foreign air chiefs on matters relating to civil aviation.

The bookings for the Whitsuntide holidays have been exceptionally heavy. Even on the London–Manchester air-way—where passengers have been few and far between for the last few weeks—all machines were loaded.

Following on our correspondent's report above, in reference to Sir Samuel Hoare's tour, we learn at the moment of going to press that, owing to the political situation, the Air Minister has curtailed his tour, and returned from Cologne to this country by air on Tuesday evening.

THE LONDON-CONTINENTAL SERVICES

FLIGHTS BETWEEN MAY 6 AND MAY 17, INCLUSIVE

Route (including certain diverted journeys)	No. of flights*	No. of passengers	No. of flights carrying: Mails	No. of flights carrying: Goods	No. of journeys completed†	Average flying time	Fastest time made by	Type and (in brackets) Number of each type flying
						h. m.		
Croydon–Paris	50‡	153	16	32	48	2 40	H.P.W.8B G-EAPJ (2h. 1m.)	B. (1), G. (12), H.P.W.8B. (4), Sp. (1).
Paris–Croydon	42	264	12	30	35	3 13	H.P.W.8B G-EAPJ (2h. 28m.)	B. (1), G. (10), H.P.W.8B. (4), Sp. (1).
Croydon–Brussels–Cologne	18§	78	14	14	17	3 52	D.H. 34 G-EBBW (2h. 39m.)	D.H. 4 (1), D.H. 18 (1), D.H. 34 (4).
Cologne–Brussels–Croydon	19‖	71	10	8	19	4 35	D.H. 34 G-EBBW (3h. 4m.)	D.H. 4 (1), D.H. 18 (1), D.H. 34 (4).
Croydon–Rotterdam ...	9	12	8	9	9	2 14	Fokker H-NABG (2h. 4m.)	F. (7).
Rotterdam–Croydon ...	9	24	9	9	8	3 31	Fokker H-NABG (2h. 18m.)	F. (6).
Manchester–Croydon–Amsterdam	20¶	75	6	9	20	5 5	—	D.H. 34 (3), Do. (1).
Amsterdam–Croydon–Manchester	26**	52	4	6	25	—	—	D.H. 34 (3), Do. (1).
Total for two weeks ...	193	729	79	117	181			

* Not including "private" flights.
† Including certain journeys when stops were made *en route*.
‡ Croy.–Lym. 9, Lym.–L.B. 9.
§ Croy.–Brus. 3.
‖ Brus.–Croy. 3.
¶ Man.–Croy. 3, Croy.–A'dam. 7, Croy.–Berlin 2.
** Berlin–Croy. 1, A'dam.–Croy. 14, Croy.–Man. 10.

Av = Avro. B. = Breguet. Br. = Bristol. Do. = Dornier. D.H.4. = De Havilland 4, D.H.9. (etc.). F. = Fokker. Fa. = Farman F 50. G. = Goliath Farman. H.P. = Handley Page. M. = Martinsyde. Sp. = Spad. Vi. = Vickers Vimy. Vu. = Vickers Vulcan. W. = Westland.

The following is a list of firms running services between London and Paris, Brussels, etc., etc.:—French Air Union; Daimler Hire, Ltd.; Handley Page Transport, Ltd.; Instone Air Line; Koninklijkie Luchtvaart Maatschappij; Aero Lloyd A.G.

FLIGHT

AIRCRAFT ACTIVITY AT KINGSTON

The H. G. Hawker Engineering Co. Busy

ALTHOUGH comparatively little has become known about the recent doings of the H. G. Hawker Engineering Co., Ltd., of Kingston-on-Thames, the firm having taken up aircraft work gradually from a very small beginning, a recent visit revealed the fact that, even if the large shops are not as busy as they were during the War, when the works belonged to the Sopwith Aviation Co., things are not by any means at a standstill. When the Sopwith Aviation Co. went into liquidation in 1920 (it has since been able to pay 20*s.* in the pound), the late Mr. H. G. Hawker, Mr. Fred Sigrist and Mr. T. O. M. Sopwith formed the H. G. Hawker Engineering Co., Ltd., and operations were commenced by the firm producing motor-cycles. Since then the Hawker motor-cycle has gained an excellent reputation, but it goes without saying that aviation pioneers like Mr. Sopwith and Mr. Sigrist could not rest content with building cycles. The Hawker Co. started in the skating rink on the corner, and as business increased it was found possible to move into the old Sopwith works, taking over one shop at a time. When we visited the works recently we were pleased to find that the skating rink had been vacated (although a lot of old associations lend to that place a certain sentimental regard which the new works can never know, the foundation of the greatness of the House of Sopwith having been laid in the old "rink") and that the whole of the Hawker Engineering Co. is now installed in the Sopwith works. Thus, although the firm is a new one, the scene of its activities is familiar, and in Sopwith and Sigrist we have the two personalities who were the moving spirits in the good old days when these two, backed by Hawker first demonstrated to a wondering world that a small biplane was capable of speeds in excess of those attained by any contemporaneous monoplanes. In hailing the arrival of the Hawker Engineering Co., Ltd., into the ranks of British Aircraft we therefore feel that we are really welcoming the re-entry of one of the pioneer British firms, and that the new company has stepped in to take up the threads where the now defunct Sopwith Aviation Co. left off. With Fred Sigrist as managing director, and Mr. Sopwith, Maj. Eyre, Mr. Bennett and Capt. Peaty on the board of directors, the firm should worthily uphold the tradition of the old Sopwith Co.

As already mentioned, motor-cycles originally formed the mainstay of the Hawker Engineering Co., but although these are still being turned out, the firm is gradually switching over to aircraft construction. On the occasion of our visit a number of "Snipes" were being reconditioned, while two other types indicated that original design will be among the firm's activities.

A careful examination of the "Snipes" showed that extraordinary care is taken to ensure that when a "Snipe" leaves the works it is in every way equal to a new machine. First, all fabric is stripped off and the various members in fuselage and wings carefully examined. Any part found to be defective, or which has the least suspicion of having suffered from storage, is removed and replaced by a new one. In the fuselage it is sometimes necessary to replace one or two struts or a longeron, and we saw several wings in which both spars and ribs had been renewed, leaving only the metal fittings of the original wing. Even the fittings are thoroughly gone over, sand-blasted to clean them and then stove enamelled, so that any incipient defect is detected and the part scrapped.

The petrol tanks are taken out of the machines, are thoroughly cleaned out to ensure that no dirt or dust is left inside, and are then tested under pressure to make sure they are up to their work. Not until then are they allowed to go back in the machines. As a matter of fact, of course, the work of reconditioning an aeroplane is, if tackled in the conscientious way of the Hawker Engineering Co., probably even more of a responsibility than building a new machine. In the latter case one is dealing with the raw product, and the various component parts can be readily inspected during the processes of manufacture. In the former case, however, it is far more difficult to spot defects, and only by the most painstaking work is it possible to ensure that every one of the numerous parts is in perfect condition. At the Hawker Engineering Co.'s works the inspection is in the hands of practical men with many years' experience, and when a "Snipe" is ready to leave it looks, and is, every bit as good as a machine built yesterday; in fact it is probably better, since such wood parts as are going to shrink or warp will have already done so, and either have been passed as thoroughly sound or else have been replaced. It might be thought that in a structure composed partly of old wood and partly of new, warping would be likely to occur, but it should be remembered that the new wood being put in has been thoroughly seasoned, so that it is probably in much the same condition as is the older timber which has been allowed to remain.

Mr. Sigrist was never easy to please in the matter of workmanship. We remember him in the old days ruthlessly scrapping anything which was not "just so." He does not appear to have lost his old liking for perfect craftsmanship, and the work now being turned out in the old Sopwith shops is of the very highest quality. This applies to woodwork as well as metal fittings, and the latter, always very neatly designed and with a minimum of surplus weight, all appear to have that typical "cleanness" which one always associated with the Sopwith machines of old.

Mention has been made of the fact that original designs are being produced at Kingston. As both the new types which are now going through the works were designed for the Air Ministry, it is not permissible to refer to them in anything like as great detail as they deserve. It may be stated, however, that one of the machines, which have been designed by Capt. B. Thomson, is a monoplane two-seater in which the question of pilot's and gunner's view has been given first place, with the result that there is practically no part of the sky which cannot be seen (and "covered") by either pilot or gunner. This machine has an all-metal fuselage and wooden wings, and the Hawker Engineering Co. is gradually working towards all-metal construction. We particularly like the manner in which the change is being made. The policy pursued is to replace, as soon as it can be commercially done, every wooden part by a metal one. We were allowed to see some experimental wing ribs and aileron spars of metal, and certainly the production of these appears to be very much of a commercial proposition. We do not know the actual cost, but as the greatest item in the manufacture of any article is always labour, the new metal ribs must be considerably cheaper than the wooden ones, being turned out (or at least capable of being turned out when put into production) "like hot cakes." It is regretted that we are not at liberty to give details, but for lightness and stiffness, as well as ease of manufacture, the new metal ribs are a distinct improvement on any which we have seen lately.

The second machine to which reference has been made is a biplane single-seater. Constructionally it is of more orthodox design than the monoplane, but it incorporates several highly ingenious features, and we should have liked nothing better than to give a detailed description of it in FLIGHT. However, although DORA is dead, there is still much in aircraft construction which is "verboten," and we must rest content with recording the fact of the machine being produced, without revealing either the purpose for which it is designed or the features which make it of particular interest. Suffice it to say that the new machine will take either a Bristol "Jupiter" or a Siddeley "Jaguar" engine. The Sopwith firm of old had a habit of startling the world with high-performance machines. There is every indication that the Hawker Engineering Co. will uphold the traditions, and that is one reason why we are particularly pleased to be able to welcome the firm into modern British aviation.

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Constructional Design of Aeroplanes

MINUTES and Proceedings No. 4 of the Institution of Aeronautical Engineers have just been published. The Minutes contain the paper, in three parts, read by Mr. C. W. Tinson before the Society on October 13 and 27, and December 1, 1922, on "Constructional Design of Aeroplanes," and the paper entitled "Oleo Undercarriage Design," read by Mr. G. H. Dowty on November 17, 1922. Copies can be obtained from the Secretary, at 60, Chancery Lane, price 2*s.* 6*d.*

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Air Mail Stamps and Correspondence

THE Editor of FLIGHT invites correspondents throughout the world to send him letters (addressed to 36, Great Queen Street, Kingsway, London) by their national or local air mails. These will have special and personal acknowledgment in the Editorial columns of FLIGHT, and help to encourage the more general use of the air for mail carrying. The Editor would also greatly appreciate any items of interest or news relating to air mail services and air stamps.

FIRST THE "JUPITER," THEN THE "CHERUB"

Fifty Hours' Run at 90 Per Cent. Full Power

RECENTLY we were able to announce that the Bristol "Jupiter" 400 h.p. radial air-cooled engine had completed 150 hours' running on the test bench, out of which one run of 50 hours non-stop was successfully completed. Just by way of showing that it is as reliable in every way as its bigger brother, the Bristol "Cherub" two-cylinder 1,086 c.c. engine was run recently for 50 hours without a stop. The occasion was the first Type Tests of this engine under A.I.D. supervision, and it had originally been intended to make the usual five 10-hour runs, but so satisfactory was the general behaviour of the engine that it was decided to complete the whole 50 hours in one non-stop run.

The tests were made on a Froude dynamometer, and the average power developed during the run was 15·4 h.p. at 2,200 r.p.m.; the average consumption of fuel for the 50 hours was 9·7 pints of petrol per hour and 0·63 pint of oil per hour. Throughout the test the engine was cooled by a fan driven by the engine itself, and connected direct to the crankshaft. At the completion of the 50 hours' endurance test, without any dismantling or adjustment of the engine, the following power curve was taken :—

r.p.m.	b.h.p.
2,460	19·2
2,366	19·42
2,360	19·68
2,170	18·32
2,040	17·68
1,960	16·93
1,900	16·6
1,775	15·0
2,450	19·6

The engine was then run for 1 hour at full throttle, developing 18·5 h.p. at 2,200 r.p.m.

At the conclusion of these tests the engine was completely stripped, measured and found to be generally in perfect condition.

This test is a very interesting and satisfactory one, more especially in view of the fact that the "Cherub" is the first engine suitable for light aircraft to be proved under official test.

The Bristol Company when putting forward this engine had originally designed it to be in two forms, ungeared and geared, and an engine of the latter type was actually designed with double helical gearing and a spring drive; but, taking all things into consideration, however, it has been decided that the lightest, simplest and most satisfactory type can be made without gearing, and that the extra efficiency obtained with gearing at the revolutions at which the engine will be run, viz. 2,200, is not worth the extra complication and expense. The production model, therefore, will be ungeared, and a series of these engines is in hand at the present time. The weight of this model is 75 lbs.

It is somewhat unfortunate that the principal competitions to be held for light aeroplanes this year are limited to a capacity smaller than that of the Bristol "Cherub"; but, on the other hand, while the object of the competitions is to obtain the maximum economy, it does not by any means follow that light 'planes of the future will be limited to 750 c.c. On the contrary, it is quite probable that, for a machine to be of practical use, a greater reserve of power will be found necessary. In that case the Bristol "Cherub" will certainly be the first to come into consideration, owing to the excellent reliability, and one can foresee the possibility of machines being produced which will fly quite strongly with pilot and passenger when fitted with a "Cherub" engine. As a matter of fact, we think that probably the line of development may be towards single-seaters with engines of 500 to 750 c.c. capacity, and two-seaters with 1,000 to 1,200 c.c. engines. When that time comes there will be less talk about "motor gliders," and the really practical machines will be purely and simply light 'planes, capable of useful service, not only over and around aerodromes, but for cross-country touring.

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NOTICES TO AIRMEN

Air Navigation (Amendment) Order, 1923

THE Air Navigation Order, 1922, has been amplified and amended by the Air Navigation (Amendment) Order, 1923, which came into operation on May 4, 1923.

The attention of all pilots is particularly directed to paragraph 9 of the Amendment Order, which is reproduced hereunder :—

9. The following amendments shall be made in Schedule IV to the principal Order :—

(i) The following paragraph shall be substituted for paragraph 14 :—

"14.—(*a*) An aircraft wishing to land at night on an aerodrome having a ground control shall, before landing, fire a green pyrotechnical light or flash a green lamp intermittently. In addition, it shall make by international Morse code, the letter group forming its call-sign.

(*b*) Permission to land will be given by the same call-sign from the ground, followed by a green pyrotechnical light, or flashing a green lamp intermittently."

(ii) In paragraph 15 the word "pyrotechnical" shall be substituted for the word "Very's."

(iii) The following paragraph shall be substituted for paragraph 16 :—

"16. An aircraft compelled to land at night shall, before landing, fire a red pyrotechnical light or make a series of short and intermittent flashes with its navigation lights."

(iv) In paragraph 17, the word "pyrotechnical" shall be substituted for the word "Very's."

(v) In paragraph 19, the word "green" shall be substituted for the word "red."

(vi) The following paragraph shall be substituted for paragraph 36 :—

"36. At every licensed aerodrome if an aircraft about to land or leave finds it necessary to make a circuit or partial circuit, such circuit or partial circuit shall, except in case of distress, be left-handed (anti-clockwise)."

(vii) In paragraph 46 the words "lights shall be placed on the aerodrome" shall be substituted for the words "the signal shall be," and the words "A red light shall indicate a left-hand circuit, and a green light shall indicate a right-hand circuit (*see* paragraph 36 of this Schedule)" shall be omitted.

Pilots and others concerned should also make themselves acquainted with the other amendments of the Air Navigation Order, 1922, contained in the Air Navigation (Amendment) Order, 1923, which is published by His Majesty's Stationery Office and may be obtained through any bookseller.

(No. 34 of 1923.)

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French Aeroplane Seized

FROM Paris it is reported that the German authorities have seized a French aeroplane of the Paris-Warsaw line which landed at Nuremberg in Bavaria. This action is a result of the fact that there is no agreement between the French and German Governments regarding the passage of aircraft. The French Ambassador in Berlin is stated to have lodged a protest against the action of the Nuremberg authorities.

The "Joy-stick" Action

ON May 17 judgment was given by the French superior tribunal for the plaintiff, M. Esnault-Pelterie, in his claim for damages against French constructors and the French government for infringement of his "joy-stick" patents. The action was begun shortly after the Armistice, and not until now has a decision been arrived at. The total damages awarded R. E. P. amount to 7,440,000 francs, the firms involved being Caudron, Breguet, and Farman, and the French State is to pay rather more than half of this amount.

Marseilles-Algiers Route opened

THE first of the seaplanes to be used by the Latecoere lines on their Marseilles-Algiers route made a flight on May 16. Leaving Marseilles at 4 a.m. the machine reached Barcelona at 8 a.m. Leaving Barcelona at 8.30 the machine arrived at Palermo at 11 a.m. and at Algiers at 2.30 p.m. The total flying time was 7 hours 45 minutes, and the total elapsed time 10½ hours, for the 682 miles distance. M. Pierre Latecoere himself was one of the passengers on this flight.

FLIGHT

LIGHT 'PLANE AND GLIDER NOTES

Those wishing to get in touch with others interested in matters relating to gliding and the construction of gliders are invited to write to the Editor of FLIGHT, *who will be pleased to publish such communications on this page, in order to bring together those who would like to co-operate, either in forming gliding clubs or in private collaboration.*

THERE is one fact which seems to be generally overlooked in connection with the competitions to be held in September, and that is that it will be possible to compete for the Selfridge Prize of 1,000 Guineas offered for gliding a distance of 50 miles. As any light 'plane capable of flying with an engine of very low power should, with the engine removed, be a reasonably good glider, it should be possible, although we doubt if it would be very efficient, so to design machines that they can be used either as light 'planes or as gliders. In this way there would be but one machine to build, one crew to send, and one pilot to keep, which fact would greatly reduce the cost of the undertaking. It is, in fact, this idea which has been at the bottom of the light 'plane designed by Major O. T. Gnosspelius and now nearing completion at the Rochester Works of Short Brothers.

* * *

IN order that the machine might trim properly both with and without engine, it had to be so arranged that the engine was placed over the c.g. This meant that the pilot's seat had to be put in front of the wing, as in most gliders, while the engine, being air-cooled and therefore needing to be exposed, was mounted in the centre-section, with chain drive to two pusher airscrews mounted on the wing. It is thus an easy matter to remove the engine and airscrews, and use the machine as a pure glider.

* * *

ALTHOUGH, as already mentioned, this might not be the most efficient arrangement, a machine strong enough to withstand the vibration of an engine having to be more strongly built, it is one which should save a good deal of money, and it should be remembered that a machine is not likely to be wanted for both purposes at the same time. As the light 'plane competitions are for economy, flights will be made in very light airs only, in order to cover a maximum distance. On the other hand, if the Selfridge Prize is to be won it will be done in a strong wind, which will enable a machine to reach a good height at the end of one range of hills before starting to glide towards the next range. To facilitate bringing back the glider the best plan would probably be to follow it in a car, having on board the engine and screw ready to be put in. The machine could then fly back to its base.

* * *

WITH reference to the manner in which competitors will tackle the light 'plane competitions for maximum distance on one gallon of petrol, there are, generally speaking, two distinct methods that may be followed. One is to fit the proper airscrew for the engine used, throttling down to the minimum power required for flight. Probably this method will not give maximum efficiency, as an engine uses more petrol per horse-power hour when throttled than it does when all out. The second method consists in fitting to the engine an airscrew too large for it, and which will therefore keep down the revolutions to a certain maximum, even at full throttle. This method should, theoretically, give the maximum mileage per gallon of fuel, but if carried sufficiently far would become dangerous, owing to the fact that there would be no reserve of power for emergencies. Probably in practice a compromise will be made, which, although keeping down the engine revolutions to some extent, does not keep them down to the absolute minimum required for flight, thus leaving a margin of power for safety.

* * *

LAST week reference was made to various firms who were building, or who would probably build, machines for the competitions. We have since learned that the Air Navigation and Engineering Co. of Addlestone will probably build two light 'planes of the type designed by Mr. Shackleton and described in our issue of March 29, 1923. It has not yet, we believe, been decided what engine is to be fitted, but the choice seems to have been narrowed down to two different types.

* * *

APART from entries by professionals, it is to be hoped that a good many amateurs will enter machines. It should not be beyond the capacity of an amateur skilled with tools to build quite a respectable machine, and if two or three friends were to club together the cost would be insignificant. The engine should not cost more than from £30 to £40, and materials another £30 to £40. Thus, not counting the time of the amateur builder, the machine should be produced for well under £100. We do not claim that such a machine would necessarily have as good a finish or workmanship as the professionally produced, but nevertheless it might have quite as good a performance, which is all that matters for the competition.

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ASSISTANCE REQUIRED

GRADUALLY the aeronautical community is coming to the conclusion that it does not know nearly as much as it thought it did about aerodynamics. Phenomena keep occurring for which present theories do not seem to account, such as the failure of certain wing sections to give, when tested on full scale, the high lift promised by model tests, or the reasons which determine the inter-action of the parts of an aeroplane upon one another. Adding up the item resistances has, in the past, usually been found to give fairly accurate results, but sometimes, for no reason that can be accounted for, the method fails entirely. Thus even in the matter of the ordinary aeroplane as we know it there are still large gaps in our theory. When we come to unusual types our ignorance becomes even more pronounced, and it is no manner of good pretending that we know. Much rather ought we to admit frankly that we know very little, and approach new subjects in a spirit of humility.

Thoughts somewhat like these were uppermost in our minds when, on a recent occasion, we visited M. Passat at Wimbledon, where he has for a large number of years been experimenting with direct-lift machines. M. Passat has passed through the wing-flapping stage and come to the conclusion that the mechanical difficulties are too great. He then set about trying to find a way of obtaining the same effect without the disadvantage of the reversal of stresses occuring in the flapping-wing type. The result is a machine in which four wings are mounted around a common shaft, extending from it radially. By a series of cams the wings are caused to rotate, "edge-on" for about two-thirds of their travel, while during the remaining one-third they turn at a large angle of incidence.

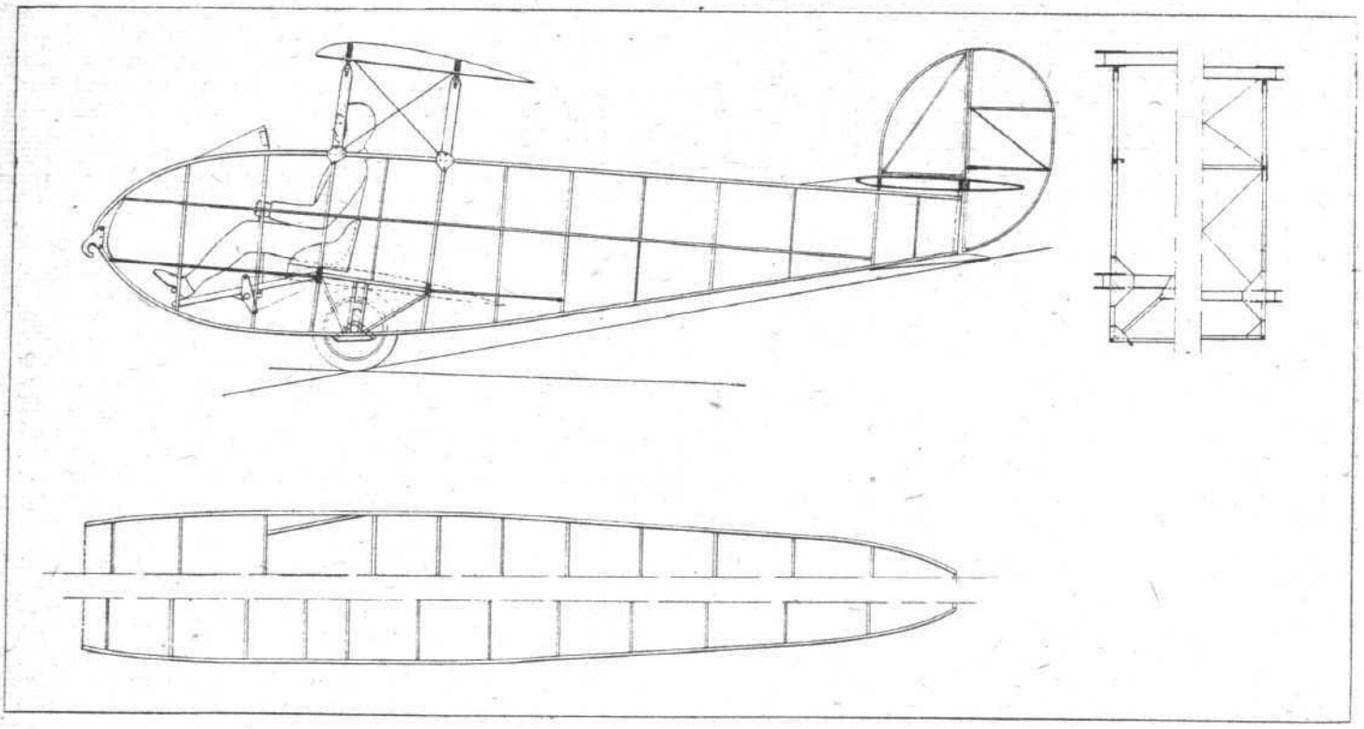
The demonstration model is a crudely-built affair, and the cams employed are of wood, with a sheathing of copper to enable them to wear a little better. The power plant is a 10 h.p. A.B.C. lent to M. Passat by A.B.C. Motors, Ltd. A reduction gear (chain) of about 20 to 1 is used, and when the engine is opened out the corner of the machine lifts. Actual measurements were difficult, but from the weight of the corner of the framework when stationary and that shown by scales when the engine was running, it appeared that the actual lift given by the wings was about 200 lbs. As the chains were too light for the work and had to be kept very tight, and as the various details of the transmission gear were of the crudest nature, while the engine certainly did not develop anything like its full power, it is assumed that the power transmitted to the wings could not have been more than 10 h.p. at the most; the lift obtained was probably in the neighbourhood of 20 lbs./h.p. This compares with that obtained with the commercial aeroplane, and is better than that of any helicopters with which we are familiar.

Although we can foresee several difficulties, such as the provision of sufficient surface for gliding down in case of engine stoppage, M. Passat's invention appears to us more promising than the majority of inventions brought to our notice, and we think that the Government might be well advised to investigate the matter with a view to extending financial assistance to M. Passat, who could not, obviously, undertake the development of his invention by himself. The very fact that, with the crudest of crude apparatus, M. Passat has obtained a lift of 20 lbs./h.p. seems to indicate that with transmission suitably designed and detail improvements in the cams, etc., a lift of nearly twice that figure is within the bounds of practical politics. At any rate, as so much money has been spent on helicopter ideas without tangible results, it does not seem wise to leave unexplored any avenue which promises to give the equivalent of the helicopter for vertical ascent, while apparently showing possibilities of greater efficiency.

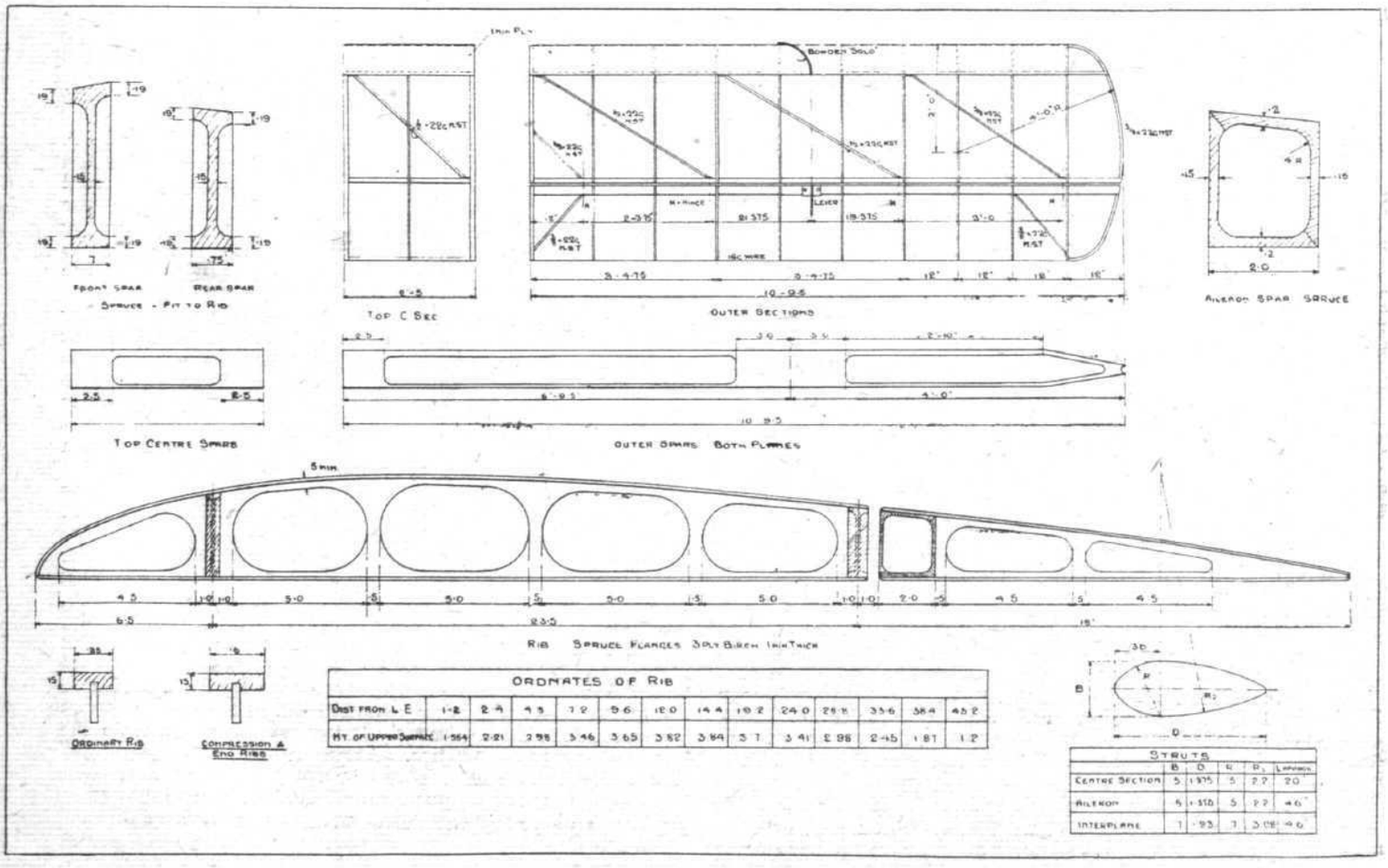
"FLIGHT" GLIDER DESIGNING COMPETITION

"K_L" Biplane Glider

Last week we published a curve of gliding angles of the "K_L" biplane glider, the general arrangement drawings of which were published in our issue of April 12, 1923. We had hoped to receive in time for inclusion in this week's issue further particulars from Mr. Ashfield, but presumably he has been enjoying a well-earned holiday, as the expected drawings have not arrived. In the meantime, however, we publish herewith two sets of drawings of "K_L", one of the fuselage and another of the wings. The wing drawings are fairly clear, but further particulars of the fuselage details are required, such as size of longerons, struts, etc. We hope these will be forthcoming in time for next week's issue.



"K_L" BIPLANE GLIDER: General lay-out of the fuselage, which is covered with 1 mm. plywood.



Ordinates of Rib													
Dist from L E	1·2	2·4	4·8	7·2	9·6	12·0	14·4	19·2	24·0	28·8	33·6	38·4	45·2
Ht. of Upper Surface	1·364	2·21	2·98	3·46	3·65	3·82	3·84	3·7	3·41	2·96	2·45	1·81	1·2

Struts					
	B	D	L	B_1	Lengths
Centre Section	5	·375	5	??	20
Aileron	5	·313	5	??	46
Interplane	1	·93	1	3·08	46

"K_L" BIPLANE GLIDER: Details of the wing construction, etc.

FLIGHT
AIRCRAFT ENGINEER & AIRSHIPS

FIVE NEW AMERICAN AEROFOILS

Some Useful Wings for Light 'Planes

The American National Advisory Committee for Aeronautics early this year issued a report on a series of tests on thick aerofoils (N.A.C.A. Report No. 152, "The Aerodynamic Properties of Thick Aerofoils, II") which were carried out in the 5-ft. wind tunnel at the Langley Memorial Aeronautical Laboratory. In order to reduce scale corrections, the speeds at which the different wings were tested was kept high, 30 to 50 metres per second (98·4 to 164 ft. per second). The models all measured 18 ins. in span, and were kept to a uniform aspect ratio of 6, *i.e.*, a 3-in. chord for the parallel wings and a *mean chord* of 3 ins. for the tapered wings. As some of these aerofoils appear to be rather promising for gliders and light 'planes, we have thought that it might be of interest to select from the large number of aerofoils of which data are given in the report a few which seem particularly suitable. Consequently in the following tables and figures particulars are given of five aerofoils which, with the exception of one, No. 55, lend themselves to cantilever construction.

The five aerofoils are shown in plan view in Fig. 1, in which the sections at centre and tips are indicated in solid black. These sections are not to be regarded as absolutely to scale, as it was difficult to plot them with any degree of

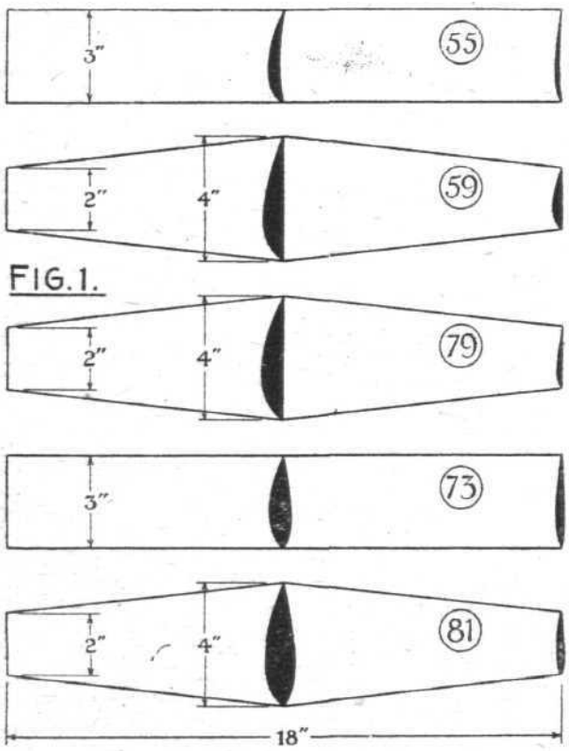


FIG. 1.

FIVE AMERICAN AEROFOILS : Plan views, with centre and tip sections shown in silhouette.

exactness on such a small scale, but they do indicate in a general way the peculiarities of the sections. Thus No. 55, which is rectangular in plan view, has a deeply cambered centre section and a fairly deeply cambered tip section. This means that there is not room for very thick spars, and that probably external bracing would be necessary.

The other wing of rectangular plan form, No. 73, also tapers in thickness, but both the centre section and the tip section are bi-convex.

Of the three tapered wings, No. 59 has the same section at the tip as at the centre, the tip section being merely a geometrical reduction of the centre section. The bottom surface is flat and the upper fairly deeply cambered. In all three tapered wings the chord at the tip is one-half the chord at the centre of the span.

No. 79 has the same centre section as No. 59, but the tip section is different, being not geometrically similar to the centre section. From the curves it will be observed that the result is a very great increase in the maximum L/D, but a reduction in the maximum lift coefficient.

No. 81, like No. 73, is of bi-convex section, but whereas No. 73 is rectangular in plan form, No. 81 is tapered, with the chord at the tip one-half of that in the centre. In this case tapering has led to a slight decrease in maximum L/D, but a slight increase in maximum lift coefficient.

As originally plotted in the American report, the German method is followed, *i.e.*, the lift coefficients are twice as large as ours, and the characteristics are plotted as polar diagrams, with K_L plotted on a base of K_D. In order to make the results more easily accessible to British readers, especially those who are not very familiar with the different systems employed by the various nations in presenting the results of wind-tunnel tests, we have re-plotted the curves for these five wings in the manner usually adopted in this country.

Thus in Fig. 2 the "absolute" lift coefficients are plotted on a base of angle of incidence, while in Fig. 3 L/D ratios are plotted on a base of "absolute" lift coefficient. This last method, of course, compares the different wings at various speeds *for the same wing loading*.

As, however, it is usually desired to compare various wings *on a basis of same landing speed* (which necessitates different wing loadings), Fig. 3 has been re-plotted in Fig. 4 on a base of λ, the various values of λ corresponding to various values of the ratio K_L/K_L max. For the benefit of those of our readers who are not very familiar with graphs showing wing characteristics it may be explained that, to take an example, $\lambda = 0{\cdot}5$ means that this point on the curve corresponds to a lift coefficient of one-half of the maximum lift coefficient, *i.e.*, K_L/K_L max. $= 0{\cdot}5$. In other words, if the maximum lift coefficient is 0·5, the lift coefficient corresponding to $\lambda = 0{\cdot}5$ is 0·25. Thus the curves in Fig. 4 show the efficiency, or, in other words, the value of lift/drag ratios, at fractions of the maximm lift coefficient ranging from 0·1 to 1. In order to form an even clearer picture of how the different wings compare, it is obviously possible, as the speed varies as the square root of the lift coefficient, to obtain a scale of speeds by calculating the value of $\frac{1}{\sqrt{\lambda}}$ corresponding to the various values of λ itself. This has been done in Fig. 4, where the lower scale is one of $\frac{1}{\sqrt{\lambda}}$ while the upper is one of λ.

With these introductory remarks for the benefit of our younger readers, let us turn to the curves and the results which they show. From Fig. 2 it will be seen that the section which gives the highest lift is No. 59. The resistance is, however, also high, and the maximum L/D is only about 15·7. Thus, in spite of the fact that No. 59 gives a high lift, it will not be a very economical section. No. 55 is also a fairly high lift section, the maximum lift coefficient being

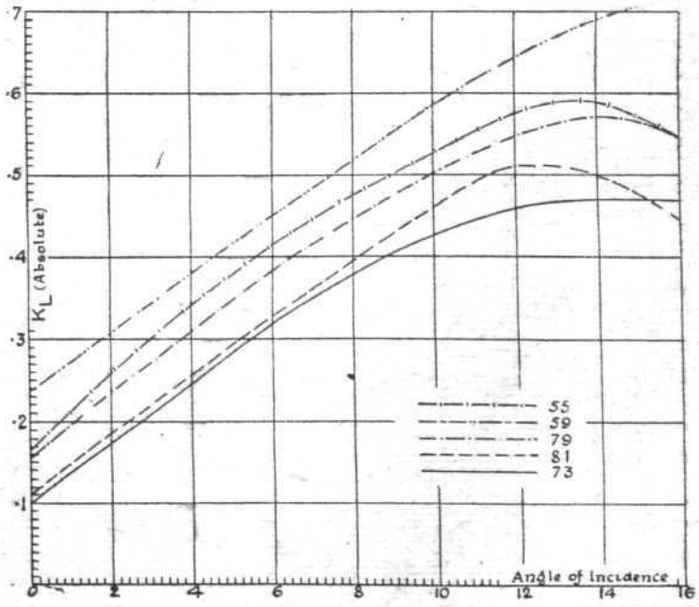
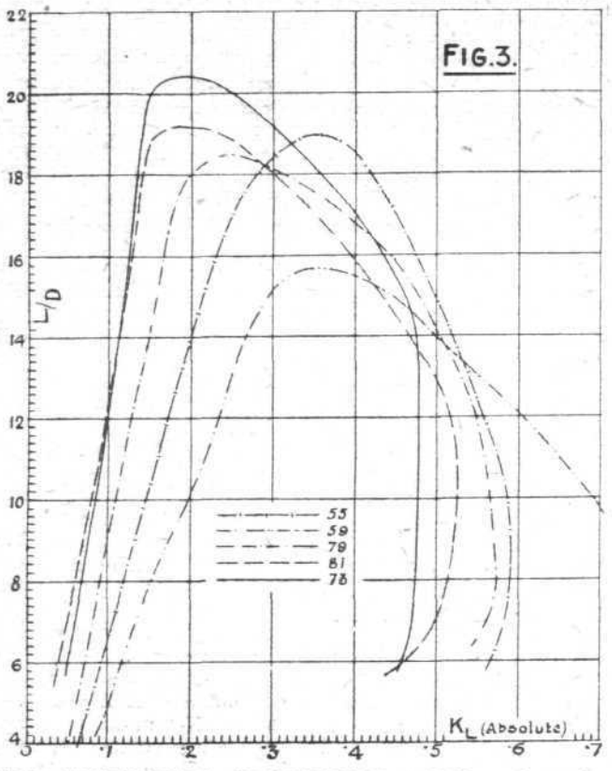


Fig. 2.—FIVE AMERICAN AEROFOILS : Lift coefficients plotted on base of angle of incidence.

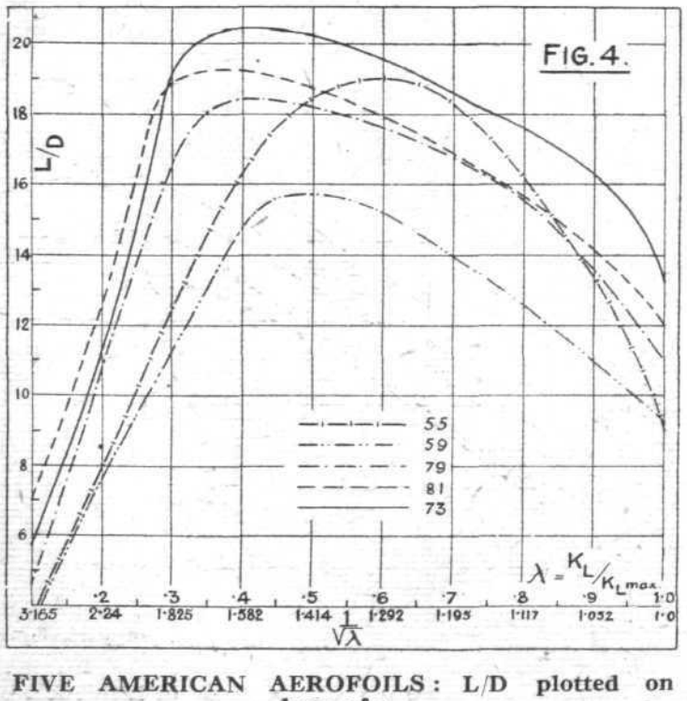
0·59. The L/D of this section is, moreover, considerably higher, the maximum value being about 19. Owing to the deep lower camber, however, No. 55 does not, as already



FIVE AMERICAN AEROFOILS: L/D. plotted on base of lift coefficient.

mentioned, give much room for spars, at any rate compared with some of the other sections, and external lift struts or wires might be necessary. Nos. 79, 73 and 81 are all very efficient sections, as will be seen from Fig. 3, the maximum lift/drag ratios being 18·4, 20·3, and 19·2, respectively. Of the three sections, No. 79 has the highest maximum lift coefficient, and No. 73 the lowest. Neither of the three give, however, very great lift, and would require light loading to give low landing speed.

Turning to Fig. 4 it will be seen that the L/D curve for No. 73 practically envelops all the others. This means that, as the curves in this figure are plotted on a base of K_L/K_L max., No. 73 is the most generally efficient of the five sections examined. The low maximum lift coefficient



FIVE AMERICAN AEROFOILS: L/D plotted on base of λ.

will necessitate light loading, but as the section in the centre is fairly deep, it should be possible to build this wing very light. As the landing speed of light 'planes may be assumed to be in the neighbourhood of 30 m.p.h., it is seen from the curves in Fig. 4 that No. 73 is the most efficient up to speeds of 1·825 times the landing speed, *i.e*, from 30 m.p.h. to 54·75 m.p.h. For speeds higher than 1·825 times the landing speed No. 81 is slightly more efficient, and in view of its very great depth, which allows of extremely light construction, might be preferable for use in connection with the Abdulla Prize of £500 for the highest speed obtained with an engine of 750 c.c. capacity.

In the tables of dimensions the depth of section is given as a percentage of the chord. As, however, percentages convey less clearly than actual dimensions in inches the various wing thicknesses, it may be of interest to examine, in a

Table of Dimensions of Five American Thick Aerofoils (at Centre of Span)

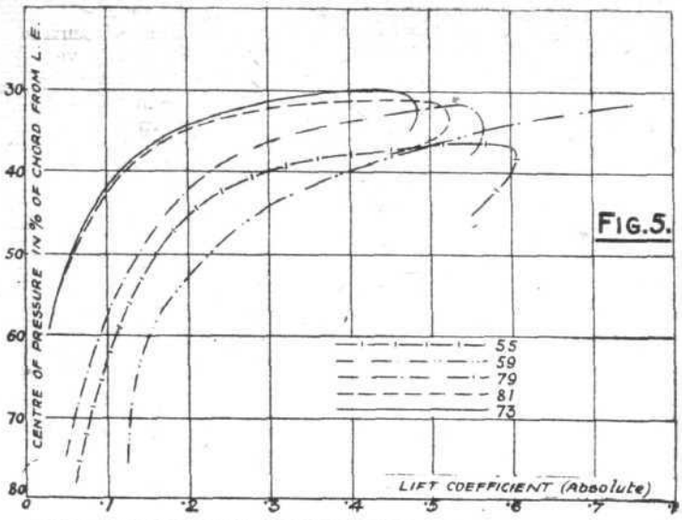
Stations in per cent. of chord.	Upper surface of all five aerofoils.	Lower surface of 55.	Lower surface of 59 & 79.	Lower surface of 73 & 81.
0	2·00	2·00	2·00	2·0
1·25	4·50	0·42	0·20	−0·56
2·5	5·75	0·67	0	−0·90
5	7·80	1·25	0	−1·67
7·5	9·60	1·74	0	−2·33
10	11·07	2·24	0	−3·00
15	13·08	3·09	0	−4·13
20	14·33	3·76	0	−5·03
30	15·73	4·52	0	−6·05
33·3	15·90	4·60	0	−6·15
40	15·73	4·52	0	−6·05
50	14·85	4·26	0	−5·70
60	13·15	3·74	0	−5·00
70	10·95	3·03	0	−4·05
80	8·40	2·17	0	−2·90
90	5·50	1·12	0	−1·50
95	3·95	0·56	0	−0·75
100	1·15	1·15	1·15	+1·15

Table of Dimensions of Five American Thick Aerofoils (at Tip of Span)

Stations in per cent. of chord.	Upper surface of Nos. 55, 79, 73, 81.*	Lower surface of 73 & 81.	Lower surface of 55.	Lower surface of 79.
0	0·50	0·50	0·50	0·50
1·25	1·12	−0·14	0·10	0·05
2·5	1·44	−0·22	0·17	0
5	1·95	−0·42	0·31	0
7·5	2·40	−0·58	0·43	0
10	2·76	−0·75	0·56	0
15	3·27	−1·03	0·77	0
20	3·58	−1·26	0·94	0
30	3·93	−1·51	1·13	0
33·3	3·97	−1·54	1·15	0
40	3·93	−1·51	1·13	0
50	3·71	−1·43	1·07	0
60	3·28	−1·25	0·93	0
70	2·73	−1·01	0·76	0
80	2·10	−0·72	0·54	0
90	1·37	−0·38	0·28	0
95	0·99	−0·19	0·14	0
100	0·29	+0·29	0·29	0·29

* The tip section of No. 59 is identical with the centre section, of which it is merely a geometrical reduction. Thus the dimensions can be obtained from figures in other table.

very general way, what sort of thickness the five wings would give if adopted for a light 'plane. As a fair average area for light 'planes we may assume 150 sq. ft., as some of the machines will undoubtedly have as much as 180–200 sq. ft. of surface (*i.e.*, those designed to fly with very small engines and at the maximum economy), while those designed for the highest speed may have wings as small as 100 to 120 sq. ft. If, therefore, we assume an average area of 150 sq. ft. we obtain, keeping to the original proportions of the five American aerofoils, a span of 30 ft. for all five sections and a chord of 5 ft. for the rectangular wings, with maximum and minimum chords of the tapered wings of 6 ft. 8 ins. and 3 ft. 4 ins. respectively. The maximum depth of the centre sections occurs at 33·3 per cent. of the chord from the leading edge, and the following maximum wing depths are found from



FIVE AMERICAN AEROFOILS : Movement of centre of pressure, plotted on base of lift coefficient.

the table of dimensions : No. 55, 6·78 ins ; Nos. 59 and 79, 12·72 ins. ; No. 73,13·23 ins. ; and No. 81 17·64 ins.

Thus even the thinnest of the sections, No. 55, is not so very thin, and although the depth at the points where would occur the front and rear spars (assuming, of course, that a single spar placed at one-third of the chord is not used) is somewhat smaller than the maximum, even No. 55 would give room for quite reasonable spars. The spar room in No. 81 is tremendous, and it should be possible to build this wing extremely light, thus making up to a certain extent for the relatively low maximum lift coefficient.

With regard to the aerodynamic qualities of the five wings, it may be of interest to examine briefly how much, expressed in horse-power, the superiority of one over the other would amount to. Let it be assumed that the total weight of a machine, with whichever wing it is fitted, is 400 lbs. This is not strictly correct, as one wing can be built lighter than another for the same strength, but it will not seriously affect the conclusions to be drawn. Let it further be assumed that the landing speed in all cases is to be 30 m.p.h. Then at $\lambda = 0{\cdot}4$, or a speed of $1{\cdot}582 \times 30 = 47{\cdot}46$ m.p.h., the wing resistance of No. 73 is 19·6 lbs.,

$$= \frac{19{\cdot}6 \times 47{\cdot}46}{375} = 2{\cdot}48 \text{ h.p.}$$

At the same speed the wing horse-power of the other four sections is as follows : No. 81, 2·63 h.p. ; No. 79, 2·75 h.p. ; No. 55, 3·1 h.p. ; and No. 59, 3·42 h.p. At a lower speed, say 1·292 times the landing speed, the figures become : No. 73, 2·12 h.p. ; No. 55, 2·18 h.p. ; No. 81, 2·31 h.p. ; No. 79, 2·35 h.p.; and No. 59, 2·72 h.p. For horizontal flight, therefore, there is not so much to choose as might be imagined, although it should be remembered that by the time the propeller efficiency, or rather inefficiency, has been taken into account the difference is greater, and with the small powers to be employed the percentage of the total power is of some importance. With reference to climb the importance is greater, and every fraction of a horse-power that can be saved is of importance.

With regard to the travel of the centre of pressure, shown in Fig. 5, none of the sections shows any marked departure from what is usual in the more ordinary aerofoils. The section which has the c.p. farthest forward is No. 73, while No. 59 has its c.p. farthest back. As, however, No. 59 is the worst of the five sections, it is not, perhaps, likely to be used, especially as its thickness is no greater than that of No. 79, which is considerably more efficient. In the case of the tapered wings, the position of the c.p. is, presumably, given as a percentage of the *mean chord*. The American report does not specifically state that this is the case, but it is assumed, because otherwise comparison with the rectangular wings would be difficult.

THE ROYAL AIR FORCE

London Gazette, May 15, 1923

General Duties Branch

The follg. Pilot Officers are confirmed in rank :—W. C. Venmore ; March 2. A. Malone ; April 19. F. R. Lines ; May 1.

Air Commodore C. R. Samson, C.M.G., D.S.O., A.F.C., is placed on half-pay, Scale A ; May 12.

Memoranda

The permission granted to 2nd Lieut. A. A. Turvey to retain rank is withdrawn on his enlistment ; April 4. The permission granted to 2nd Lieut. B. E. Hawkins to retain rank is withdrawn on his joining the Territorial Army.

London Gazette, May 18, 1923

General Duties Branch

Flying Offr. J. M. Adams is granted a perm. commn. in rank stated ; Sept. 16, 1919. (Since transferred to Stores Branch for accountant duties.) *Gazette* Sept. 16, 1919, apptg. him to a short service commn., is cancelled. Flying Offr. A. A. Ward is granted short service commn. in rank stated for seven years on active list ; May 16. F. A. Pumphrey is granted short service commn. as Flying Offr. for five years on active list, with effect from, and with seny. of, May 4. Lieut. E. T. O'N. Hogben, R.G.A., is granted temp. commn. as Flying Offr. on secdg. for four years' duty with R.A.F. ; May 15. Air Commodore C. L. Lambe, C.B., C.M.G., D.S.O., is placed on half-pay Scale A ; March 1. Flying Offr. S. R. Gellett is placed on retd. list ; May 16. *Gazette* Dec. 5, 1922, concerning Flying Offr. R. Lamb, is cancelled.

Stores Branch

The following are granted perm. commns. s Flying Offrs. for accountant duties, with effect from dates indicated. *Gazettes* of dates indicated in brackets, apptg. them to short service commns., are cancelled :—R. H. Cleverly ; Jan. 15, 1921 (Feb. 4, 1921) (since promoted). F. J. S. Short ; July 4, 1921 (July 19, 1921).

The follg. are granted short service commissions as Pilot Offrs, on probation, with effect from, and with seny. of, May 2 :—G. Bucknall, J. H. P. Clarke. R. A. Dolton, A. J. Grant, F. C. C. B. Hichens, N. W. Law, F. A. R. Smith, W. J. Eagle is granted short service commission as Flying Offr. for three years on active list, with seny. of Jan. 27, 1920 ; April 7. Wing Cmdr. T. O. Lyons, O.B.E., is restored to full pay from half-pay ; May 14.

Medical Branch

The follg. are granted short service commissions in the ranks stated, with effect from, and with seny. of, the dates indicated :—

Flight Lieut.—E. D. D. Dickson, M.B., F.R.C.S. (E.) ; May 2.

Flying Officer.—J. B. Gregor ; April 30. H. H. R. Bayley is granted a temp. commission as Flight Lieut., with effect from, and with seny. of, April 27. Flight Lieut. C. S. Dowdell relinquishes his temp. commission on ceasing to be employed ; April 25.

Reserve of Air Force Officers

Class A

The follg. are granted commissions on probation in ranks stated in General Duties Branch :—

Flying Officers.—G. Cameron, W. Cameron, J. A. Craig, D.F.C., S. A. Dismore, C. H. Graham, J. Hart, E. A. Jones, A. N. Kingwill, C. B. J. Lancaster, A. T. Maxwell, B. R. Millar, J. H. Paton, A. Russell, J. Snedden, G. C. Walker, G. F. Yuill ; May 15.

Pilot Officers.—G. C. H. Dorman ; May 8. P. G. Addie, D. C. Bain, J. R. Brown, D.F.C., A. Cairnie, C. W. Calder, W. S. Dailey, L. E. Headley, A. Mackenzie, G. E. Muir, G. W. Perks, L. R. Robertson, J. F. Turpie, A. Wren ; May 15. Flying Offr. J. H. Vickers relinquishes his commission on account of ill-health contracted in the Service, and is permitted to retain the rank of Lieut. ; April 20.

Class C.

Flying Offr. I. G. G. Edgar is transferred from Class A to Class C ; May 1. Observer Offr. P. J. Bradley is transferred from Class B to Class C ; May 1.

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the R.A.F. are notified :—

Air Commodore : C. R. Samson, C.M.G., D.S.O., A.F.C., to Half-pay List. 12.5.23.

Group Captain : N. D. K. MacEwen, C.M.G., D.S.O., to R.A.F., Transjordania Headquarters, Palestine, to command. 16.4.23.

Wing Commander : I. T. Courtney, O.B.E., to R.A.F. Depot, whilst attending course at Senior Officers' School, Woking. 25.5.23.

Squadron-Leader : K. R. Park, M.C., D.F.C., to Aircraft Depot, Egypt. 5.5.23.

Flight-Lieutenants : M. Keegan, O.B.E., M.M., to Mechanical Transport Workshops and Pool, Palestine. 5.5.23. W. Underhill, D.S.C., to No. 4 Flying Training School, Egypt, for course of instruction. 5.5.23. B. Ankers D.C.M., to No. 1 Flying Training School, Netheravon. 21.5.23. H. H, Balfour, M.C., to Half-pay List. 25.4.23.

Flying Officers : B. G. Drake, to Headquarters, Coastal Area, for course of instruction in pay and stores accounting at Air Ministry. 1.5.23. E. J. H. Wright, to No. 41 Sqdn., Northolt. 14.5.23. B. J. O'Connor Hanstock to No. 31 Sqdn., India. 15.4.23. J. B. L. H. Cordes, to No. 29 Sqdn. Duxford. 14.5.23. E. A. Sullock, A.F.C., to No. 19 Sqdn., Duxford. 14.5.23. A. A. N. D. Pentland, M.C., D.F.C., to R.A.F. Depot. 23.4.23. A. A. N. D. Pentland, M.C., D.F.C., on appointment to a Short Service Commission, to Armament and Gunnery School, Eastchurch. 14.5.23. L. D. Stewart, to H.M.S. "Pegasus." 5.5.23.

Pilot Officer : C. J. Stone, to Central Flying School, Upavon, for course of nstruction. 8.5.23.

Stores and Accountants' Branch

Flight-Lieutenants (Stores) : D. W. Wilson, to Engine Repair Depot, Egypt, 5.5.23. J. L. Denman, to Aircraft Depot, Egypt. 5.5.23. K. D. G. Collier to Headquarters, R.A.F., India. 17.4.23.

Flying Officers (Stores) : A. G. Knight, M.B.E., to No. 27 Squadron, India, 23.2.23, instead of to Aircraft Depot, India, as previously notified. G. W. Sturman, to Aircraft Depot, India. 1.4.23. H. Jones, to No. 41 Squadron, Northolt. 4.5.23. D. Barron, to No. 56 Squadron, Hawkinge. 3.5.23. A. McC. Goddard, to School of Technical Training (Men), Manston. 4.5.23. E. W. Husband, to No. 47 Sqdn., Egypt. 5.5.23.

Flying Officers (Accountants) : A. L. Palmer, to No. 41 Squadron, Northolt. 23.4.23. L. J. Marden, to Superintendent of Reserves Headquarters, Northolt. 1.5.23.

Pilot Officers (Stores) : G. Bucknall, J. H. P. Clarke, R. A. Dolton, A. J. Grant, F. C. C. B. Hichens, N. W. Law and F. A. R. Smith, all to No. 1 Stores Depot, Kidbrooke. 2.5.23, for course of instruction, on appointment to a Short Service Commission.

Pilot Officers (Accountants) : R. W. Freeman and F. C. Langley, both to Headquarters Coastal Area, on appointment to a Short Service Commission, for course of instruction in pay and stores accounting at Air Ministry. 26.4.23. E. C. Green, F. M. Hall and J. H. S. Richards, all to Headquarters, Coastal Area, on appointment to a Short Service Commission, for course of instruction in pay and stores accounting at Air Ministry. 1.5.23.

IN PARLIAMENT

Airships

CAPT. W. BENN on May 14 asked the Prime Minister when a decision will be announced in reference to the establishment of a company to run airships; and what Department of State will control such a contract?

Mr. Baldwin: As stated in the reply given on May 7, negotiations are proceeding with the parties interested, and no decision has yet been arrived at. I do not anticipate a very early decision.

Air Power Committee

CAPT. W. BENN on May 17 asked the Prime Minister whether a Report will be issued giving the conclusions arrived at by Lord Salisbury's Committee on Air Power; and what are the relations between this Committee and the Sub-Committee of the Committee of Imperial Defence which is enquiring into the distribution of defence work between the three Services?

Mr. Baldwin: The conclusions arrived at by Lord Salisbury's Committee will be communicated in the first instance to the Cabinet according to the invariable practice of the Committee of Imperial Defence. The Government are anxious to take the House into the fullest confidence that is possible in this matter, but it is premature to announce the form in which the statement of policy will be made. Both investigations referred to in the second part of the question are included in the scope of Lord Salisbury's Committee.

Capt. Benn: Is Lord Salisbury, then, the Chairman of the Sub-Committee of the Imperial Defence Committee?

Mr. Baldwin: I should gather that from the answer.

SOCIETY OF MODEL AERONAUTICAL ENGINEERS
(London Aero Models Association)

THE Duration Competition for fuselage gliders for the "Western" Challenge Cup will be held at Parliament Hill on June 3 at 11 a.m. The following are the special conditions:—(1) Any type of glider may compete so long as the fuselage conforms to Rule No. 12. (2) When more than one fuselage is used on a model such must conform to Rule No. 12. (3) All gliders must be launched by hand. Prizes: (1) Silver Medal and winner to hold Cup for the year. (2) and (3) Second Class Diploma. Entries for this event must reach the Competition Secretary, Mr. C. Bayard Turner, 21, Lanercost Road, Tulse Hill, S.W., before 8.30 p.m., Friday, June 1.

A. E. JONES, Hon. Sec.

"FULL SPEED AHEAD" AT "SMITH's"

WHEN paying a visit the other day to the Cricklewood works of S. Smith and Sons (M.A.), Ltd., it was extremely gratifying to note the exceptional activity displayed all over these extensive works. Since our last visit, about a year ago, when not a little difficulty was experienced in obtaining sufficient work to enable their large plant and numerous skilled workers to be kept going to the best advantage, matters have steadily been improving, and the works are now going right up to their maximum capacity—and difficulty is even being experienced in keeping up with orders.

The greater portion of the work being done at Smith's is in connection with motor-car equipment, such as lighting and starting sets, speedometers, clocks and watches, mechanical horns, carburettors, pressure gauges, jacks, pumps, etc. In this connection it may be of interest to note that Smith speedometers and clocks are standard equipment on over 80 per cent. of post-War British cars, in addition to the various other accessories which are also adopted as standard fittings by numerous makers. As regards the aviation section, this is also going strong, many contracts having been obtained from foreign Governments, such as China, Japan, Russia, etc. Smith's aviation instruments need no introduction to our readers, as their famous air speed indicators, altimeters, petrol gauges, etc., have been described on various occasions in FLIGHT. It only remains for us to conclude by emphasising the fact that *all* of the Smith instruments and accessories are entirely British made, and with the exception of perhaps but one component part—which has to be obtained from "outside"—are made from start to finish at the Cricklewood Works.

PUBLICATIONS RECEIVED

Si Puo Gia Tentare un Viaggio Dalla Terra Alla Luna? By Ing. Luigi Gussalli. Societa Editrice Libraria, Via Ausonio, 22, Milan, Italy.

Pneumostabiliseur Universel. By C. Platounoff. A. Bieleveld, 66, Rue Montagne-aux-Herbes-Potageres, Brussels. Price 2frs.

The Internal-Combustion Engine. Vol. II. High-Speed Engines. By H. R. Ricardo. London: Blackie and Son, Ltd., 50, Old Bailey, E.C. Price 30*s.* net.

Department of Overseas Trade. Report on Economic Conditions in France to March, 1923. By J. R. Cahill. London: H.M. Stationery Office, Kingsway, W.C. 2. Price 3*s.* 6*d.* net; by post, 3*s.* 8*d.*

Bulletin No. 3, *Section No.* 12. *Wing Tip Research.* By J. H. Parkin, H. C. Crane and J. S. E. MacAllister. University of Toronto, Faculty of Applied Science and Engineering, Toronto, Canada.

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